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CASE OF RARE VASO-MOTOR DISTURBANCE
IN THE LEG.

BY

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JOSEPH MOODY, æt. 29. The patient was admitted into the Royal Free Hospital in Dec. 1878, suffering from a peculiar vaso-motor disturbance in his right leg.

There was no family history bearing on the case. The father and mother are living, but the father is not very strong. A brother died an idiot in Earlswood Asylum. He knows of no history of gout, consumption, or neuroses in the family, except the one case of idiocy mentioned. He is married, with 2 children, one other child died in convulsions. His wife never miscarried. He always had good health before his present illness. He has had gonorrhœa, but appears never to have had syphilis. Always temperate, and for some years past has been a total abstainer.

His present illness began about $4\frac{1}{2}$ years ago. About nine months before the first definite onset he had an attack of pain and swelling in the right great toe, coming on gradually for a week, increased by walking, and associated with a little redness. Rest and the application of an ointment cured him in a few weeks. He then remained free from any trouble in the foot for several months, when he began to feel an irritating warm sensation in the great toe joint, which came on when he began to walk. This sensation was associated with some swelling of the toe. He was quite free from it when lying down at night. Shortly afterwards the warm feeling on exercise extended over the whole foot; which became swelled, scarlet, and hot to the touch. Whenever he walked the foot was subjectively so hot that it felt as though

it was in scalding water. For a long time, however, it did not prevent him from working, and even from standing on the leg for 12 or 14 hours a day. There was no lameness and no pain other than this burning. So hot was the foot, both objectively and subjectively, that even in frosty weather he was unable to bear a stocking upon it, and would go about with only a boot.

His occupation has been connected with the sea, fishing, sailing in pleasure yachts, &c.; and he has been in the habit, like other sailors, of standing and working in the water with naked feet for many hours at a stretch, at all seasons of the year. He has often during the colder seasons had his feet almost constantly cold for months together, and they have often been so numbed with cold that for hours at a time he has been unable to feel them. After being thus exposed his feet have often glowed with reaction, but he thinks not more than is usual in such circumstances.

Gradually the tendency to redness and swelling extended half-way up to the knee, and the condition of the foot when he walked became so much worse that about eighteen months after the first onset he gave up work. The foot still remained free from trouble so long as he rested, but the congestion came on almost directly if he stood on the foot, or if he put the foot near the fire.

Six months before he gave up work, and whilst he was still using the right leg quite as much as the left, he noticed that the calf of the right leg was very decidedly smaller than that of the left, and since that time the difference between the two legs has gone on increasing.

Between two and three years ago a medical man whom he had consulted, thinking that the cause for the condition was to be found in the great toe, where he believed there was some dead bone, amputated the toe; but the patient afterwards learnt that no dead bone was found. The wound became very much inflamed, and was a long time in healing. Since that time the foot has been worse than before, and the redness and heat have extended up the thigh to the buttock. Sometimes the attack begins in the foot and passes upwards. Sometimes it begins in the buttock or knee and goes downwards. He never passes a day without having an attack. The attacks now come on by day and night, irrespective of his hanging the foot down, and last for several hours at a time. In the intervals between the attacks the foot is very cold both subjectively and objectively.

For a few months past he has begun to experience attacks of heat in the left foot and leg. The sensation is accompanied by redness and a little swelling, but to a much less extent than in the right leg. It generally comes on rather before the attack in the right leg, and does not last nearly so long as the latter. He finds that any excitement will bring on the attack very severely. He thinks the leg is better if he has plenty of nourishing food.

In the intervals between the attacks the right foot is of the same size as the left. The tendons are well defined on the dorsum, there being distinct hollows between them. The skin, though permanently somewhat red, is wrinkled as in a healthy foot. The foot feels ordinarily very cold to the hand; but when the attack comes on, it rapidly becomes very hot, beginning at the scar where the toe was amputated. The hollows between the tendons become effaced, and the skin becomes tense and smooth.

Comparative Temperature.—A series of observations was made with Steward's surface thermometer, with the following results :—

Right Foot.—During the attacks the temperature of the foot varied from 91° to 94° ; the temperature of the dorsum being always a little lower (1 to $1\frac{1}{2}$ degrees) than that of the sole. In the intervals of the attacks, the temperature of the foot was always too low to be registered by the thermometer, which was not arranged for temperatures below 75° .

Left Foot.—After sitting in the neighbourhood of a fire, and when the foot felt to him of a comfortable warmth, but without its having been exposed to the direct heat of the fire, the foot registered $90\cdot4^{\circ}$, and on another occasion 83° .

On another occasion, when he had a little burning sensation in the left foot, the temperature was $91\cdot5^{\circ}$.

After walking for some distance in the street, which had induced a strong burning sensation in the right foot, the thermometer registered $96\cdot8^{\circ}$.

There is extremely marked atrophy of the muscles of the right leg, as indicated by the following measurements :—

	Right.	Left.
Circumference of middle of thigh . . .	$14\frac{1}{4}$ in.	$16\frac{1}{2}$ in.
Greatest circumference of calf . . .	$9\frac{3}{4}$ „	11 „

There is marked increase in the reflex irritability in the muscles of the right leg: thus, when the sole is lightly tickled a much greater flexion of the foot takes place than on the left side under similar circumstances. If the hand be

placed behind the head of the tibia and the leg supported upon it, a moderate clonic spasm in the limb is excited. There is, however, no apparent increase in the tendon reflex of the *ligamentum patellæ*.

The muscles of the right leg were found on careful investigation to have undergone a marked modification in their electrical reaction. With the induced current it was found that when the rheophores were placed over the muscles themselves, there was a very marked diminution in irritability amounting to as much as four or five divisions in the bar of Stöhrer's battery. This is seen uniformly in all the muscles of the limb. If the rheophores be placed over the nerve-trunk, however, the diminution is much less marked, and does not amount to more than from 1 to $2\frac{1}{2}$ divisions on the bar.

With Voltaic electricity (slow interruption) a similar result was obtained. When the rheophores were placed over the muscles on the right side, no reaction was produced by a strong current of 20 cells (Stöhrer). When the muscles of the left leg were treated in the same way, contraction was produced by 8 cells.

When the rheophores were applied over the nerve-trunk contraction was produced on the right side by 8 cells, and on the left side by 6 cells.

General sensibility, sensibility to heat and cold, and the muscular sense were quite unaffected.

This case belongs to a group of which a masterly description has recently been given by Dr. Weir Mitchell, in the 'American Journal of the Medical Sciences' for July, 1878. He narrates five cases which came under his own notice, and quotes seven others from various sources, two of which occurred in the practice of Dr. Graves, and one in that of Sir James Paget, who published the case in the 'St. Bartholomew's Hospital Reports' for 1871. According to Dr. Mitchell, the disease occurs nearly always in the male sex 'after some constitutional disease, or after prolonged physical exertion afoot.' It begins with pain 'in the ball of the foot or of the great toe, or in the heel; and from these parts it extends so as to involve a large portion, or all, of the sole, and to reach the dorsum or even the leg. More often it is felt finally in a limited region of one or both soles, and does not extend beyond these areas. At first it is felt only towards night, and is eased by the night's rest. In the later stages, the pain is throbbing, aching, and burning. In every case and at all

stages, the pain is relieved or arrested by the horizontal position and by cold. It is brought on and made worse by standing or walking; and in bad cases by allowing the feet to hang down; while warmth, and of course heavy foot-covers, act in like manner. The sufferer sleeps with uncovered feet, and goes about without stockings in his house, and finds even in winter a light slipper or low shoe comfortable. . . . In the worst cases, when the patient is at rest the limbs are cold and even pale. The flushing which at first seems to be an active condition, accompanied with rise of temperature, in a few minutes becomes passive; that is, the arteries cease to throb, the heat lessens, and there is evidence of lessened oxidation.' My case differs from this description in the fact that some of his most severe attacks come on when he is in the recumbent position.

Dr. Mitchell says that two of his cases were associated with evident spinal symptoms, such as atrophy of muscles, tightness round the waist, and partial loss of power. In the case I have just read there was marked muscular atrophy, which the patient stated to have come on before he gave up using the limb.

Dr. Mitchell mentions that in one of his cases the attack of heat and redness, which had at first been confined to the feet, at a later stage extended to the hands also. This is in accordance with the fact met with in my case, that the attacks which were for a long time confined to the right leg are now extending to the left.

Dr. Mitchell states that these cases are 'rarely amenable to treatment. They are aided for a time by cold and by rest, but usually they remain unchanged for years, or else, in rare instances, become gradually worse.' The treatment I have adopted has been rest with the leg raised, tonics, and the application of atropine ointment diluted with an equal quantity of lard. The ointment appears to have had a very decided influence in checking the attacks. He had himself adopted a system of entire rest before he came under my observation, but he rarely went twenty-four hours without an attack. He wrote to me towards the end of February to say that he had not had a severe attack for a month. He had at that time been using the ointment for rather more than two months.

Dr. Mitchell abstains from speculating on the pathology of the affection. I believe I shall be exercising a wise discretion in following the same course. That it is a lesion of

the vaso-motor centres there can be no doubt, but until we have rather more knowledge about the physiology of these centres, it would be of little use to talk about their pathological changes. I would, however, throw out the suggestion that the proximate cause in the present case is to be found in the prolonged excitation to which these centres were subjected at those periods when, as the patient says, his feet were numbed and cold for months at a time, as the result of his seafaring occupation. Just as over-exertion of the co-ordinating centres of the hand will in certain cases induce writer's cramp, so a prolonged over-excitation of the vaso-motor centres may be supposed to induce irregular action on their part. It is of interest to note that, in the case narrated by Sir James Paget, the affection was clearly traced to exposure of the lower extremities to repeated shocks of cold.